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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/877,810	06/07/2001	Jonathan J. Barrow	EMC-01-087	1207

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EXAMINER
TAYLOR, NICHOLAS R

ART UNIT	PAPER NUMBER
2141	

DATE MAILED: 11/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

		Application No.	Applicant(s)
Office Action Summary		09/877,810	BARROW ET AL.
		Examiner	Art Unit
		Nicholas R. Taylor	2141

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *15 August 2005*.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-14,18-31 and 41-44* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-14,18-31 and 41* is/are rejected.

7) ☒ Claim(s) *42-44* is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on *06/07/2001* is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

1.   Claims 1-14, 18-31, and 41 have been presented for examination and are

rejected. Claims 42-44 are objected to.

Allowable Subject Matter

2.   Claims 42-44 are objected to as being dependent upon a rejected base claim,

but would be allowable if rewritten in independent form including all of the limitations of

the base claim and any intervening claims.

Response to Arguments

3.   Applicant's arguments filed 8/15/2005 have been fully considered but they are

deemed not persuasive.

4.   In the remarks, applicant argued in substance that:

        (A) The combination of the prior art of Papa, Hoese, and Story was improper due

to unobviousness. Specifically, nothing in the art would enable a functional combination

of Papa, Hoese, and Story. Furthermore, the prior art does not teach a test loop with

verification of the I/O controller.

        As to point (A), response to any arguments concerning the combination of

Papa/Hoese, and the presence of the test loop verification in Story can be found in a

previous office action.

As to applicant's argument that further combining with Story would not produce a properly functioning system, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Potential complications in the physical implementation of the resulting combined system do not invalidate the combination of the three references, all of which are found in subclass of class 710. The test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-3, 5-8, 10, 11, 14, 18-20, 22-25, 27, 28, 31, and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Papa et al. (US Patent 6,342,608) and Hoese et al. (US Patent 6,421,753), further in view of Story et al. (US Patent 6,260,092).

2.   As per claims 1 and 18, Papa teaches a network adapter that may be used in a

network data storage system (Papa, column 3, line 65 to column 4, line 6) to permit data

communication among data exchanging devices and a data storage system input/output

(I/O) controller, the controller residing in the data storage system, the data exchanging

devices being external to the adapter, the adapter comprising (Papa, column 7, lines

26-33):

one or more interfaces that may be coupled to an electrical backplane of the

system, the backplane being coupled to the controller and being configured to permit

communication between the controller and the adapter when the one or more interfaces

are coupled to the backplane (Papa, column 7, lines 7-15, and figure 3c);

and a system integrated into the adapter, the system having a first set of ports

that may be coupled to the data exchanging devices (Papa, column 8, lines 33-38) and

a second set of ports that may couple the system to the controller when the one or more

interfaces are coupled to the backplane (Papa, column 7, lines 7-15, and figure 3c).

However, although Papa teaches the use of any compatible controller card

(Papa, column 8, lines 45-48), Papa fails to teach the specific use of a switch system.

Hoese teaches the use of a switch system that controls data flow in a storage network

(Hoese, column 3, lines 38-44). It would have been obvious to one of ordinary skill in

the art, at the time the invention was made, to have combined Papa and Hoese to

provide the switching system of Hoese in the system of Papa, because doing so would

allow the ability to centralize local storage for networked workstations and allow

accessing the virtual storage as if it were local (Hoese, column 2, lines 26-29).

Papa-Hoese teaches the system further wherein the switching system is configured to selectively provide one of (i) communications between the controller and the data exchanging devices through the first and second sets of ports; (Papa, column 7, lines 26-33) and

wherein the controller is a single circuit board having multiple Fibre Channel interfaces (Hoese, column 3, lines 33-36).

However, Papa-Hoese fails to teach, yet Story teaches (ii) a test loop which loops the second set of ports back to the controller to enable the controller to diagnostically test controller operation and connectivity between the controller and the adapter through the backplane using a set of test vectors through the second set of ports; (Story, column 3, lines 28-39 and Summary, wherein a test vector is looped back through a fibre system for diagnostic testing)

wherein the switching system is further configured to isolate the controller from the data exchanging devices to avoid escape of signals from the controller to the data exchanging devices when the switching system selectively provides the test loop; and (Story, column 3, lines 28-39, specifically wherein the loop testing is performed without producing output)

wherein the switching system is configured to daisy chain the multiple Fibre Channel interfaces of the single circuit board together exclusive of the data exchanging devices when the switching system selectively provides the test loop (Story, column 7, lines 45-55).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have combined Papa-Hoese and Story to provide the fibre channel system improvements of Story in the system of Papa-Hoese, because doing so would improve the bandwidth and provide connectivity to buses while maintaining compatibility with present controllers and peripherals.

3.   As per claims 2 and 19, Papa-Hoese-Story teaches the system further wherein the one or more interfaces comprise at least one interface through which a command may be issued to the adapter to cause the adapter to change from an operational mode to a diagnostic mode (Hoese, column 7, lines 24-28).

4.   As per claims 3 and 20, Papa-Hoese-Story teaches the system further wherein the data storage system comprises a set of mass storage devices that may exchange data with the data exchanging devices via the adapter (Papa, column 3 line 65 to column 4, line 6).

5.   As per claims 5 and 22, Papa-Hoese-Story teaches the system further wherein the switching system comprises a fibre channel switching fabric (Hoese, column 3, lines 33-36).

6.   As per claims 6 and 23, Papa-Hoese-Story teaches the system further wherein the one or more interfaces comprise a management interface through which the

controller may issue (Hoese, column 7, lines 24-28) via the backplane a command to the adapter (Papa, column 7, lines 26-33).

7.   As per claims 7 and 24, Papa-Hoese-Story teaches the system further wherein the one or more interfaces permit a processor to issue a command to the adapter via the backplane, the processor being external to the data exchanging devices, the adapter, and the controller (Papa, column 4, lines 11-16, wherein the processor is a separate module external to the others, see also figures 1 and 2).

8.   As per claims 8 and 25, Papa-Hoese-Story teaches the system further wherein the processor is external to the data storage system (Papa, column 4, lines 11-16, wherein the processor is a separate module external to the data storage devices, such as those shown 172 of figure 1).

9.   As per claims 10 and 27, Papa-Hoese-Story teaches the system further wherein the one or more interfaces include a first interface and a second interface, the first interface permitting the controller to issue a first command to the adapter for causing the adapter to change from a first mode of operation to a second mode of operation (Hoese, column 7, lines 25-30), the second interface permitting configuration-related information to be retrieved from a non-volatile memory comprised in the adapter (Hoese, column 6, line 61 to column 7, line 3).

10.   As per claims 11 and 28, Papa-Hoese-Story teaches the system further wherein in the second mode of operation, a diagnostic test of the adapter is performed (Hoese, column 7, lines 25-30).

11.   As per claims 14 and 31, Papa-Hoese-Story teaches the system further wherein the adapter is an electrical circuit card that is configured to be electrically and mechanically coupled to the backplane (Papa, column 7, lines 7-15).

12.   As per claim 41, Papa teaches a network adapter configured to permit data communication among data exchanging devices and a data storage system input/output (I/0) controller of a network data storage system (Papa, column 3, line 65 to column 4, line 6), the controller residing in the data storage system, the data exchanging devices being external to the data storage system, the network adapter comprising (Papa, column 7, lines 26-33):

        adapter interfaces configured to couple to an electrical backplane of the network data storage system, the electrical backplane being coupled to the controller and being configured to permit communication between the controller and the adapter when the adapter interfaces couple to the electrical backplane; (Papa, column 7, lines 7-15, and figure 3c) and

        a subsystem coupled to the adapter interfaces, the subsystem having a first set of ports configured to couple to the data exchanging devices (Papa, column 8, lines 33-

38) and a second set of ports configured to couple to the controller when the adapter

interfaces couple to the electrical backplane (Papa, column 7, lines 7-15, and figure 3c).

However, although Papa teaches the use of any compatible controller card

(Papa, column 8, lines 45-48), Papa fails to teach the specific use of a switch system.

Hoese teaches the use of a switch system that controls data flow in a storage network

(Hoese, column 3, lines 38-44). It would have been obvious to one of ordinary skill in

the art, at the time the invention was made, to have combined Papa and Hoese to

provide the switching system of Hoese in the system of Papa, because doing so would

allow the ability to centralize local storage for networked workstations and allow

accessing the virtual storage as if it were local (Hoese, column 2, lines 26-29).

Furthermore, Papa-Hoese teaches

the switching subsystem being configured to selectively provide one of (i)

communications between the controller and the data exchanging devices through

the first and second sets of ports; (Papa, column 7, lines 26-33) and

the controller being a single circuit board having multiple Fibre Channel

interfaces (Hoese, column 3, lines 33-36).

However, Papa-Hoese fails to teach

(ii) a test loop which loops the second set of ports back to the controller to enable

the controller to diagnostically test controller operation and connectivity between the

controller and the adapter through the backplane using a set of test vectors through the

second set of ports;

the switching subsystem being further configured to isolate the controller from the

data exchanging devices to avoid escape of signals from the controller to the data

exchanging devices when the switching subsystem selectively provides the test loop;

and

the switching subsystem being further configured to daisy chain the multiple

Fibre Channel interfaces of the single circuit board together exclusive of the data

exchanging devices when the switching subsystem selectively provides the test loop.

Story teaches managing fibre channel serial connections (Story, Summary

section) wherein a test vector is looped back through a fibre system for diagnostic

testing (Story, column 3, lines 28-39). Story also teaches the controller isolated from

the data exchanging devices to avoid escape of signals when providing the test loop

(Story, column 3, lines 28-39, specifically wherein the loop testing is performed without

producing output) and Story teaches daisy chained multiple fibre interfaces exclusive of

data exchanging devices when providing a test loop (Story, column 7, lines 45-55).

It would have been obvious to one of ordinary skill in the art, at the time the

invention was made, to have combined Papa-Hoese and Story to provide the fibre

channel system improvements of Story in the system of Papa-Hoese, because doing so

would improve the bandwidth and provide connectivity to buses while maintaining

compatibility with present controllers and peripherals.

13.   Claims 4, 9, 21, and 26 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Papa et al. (US Patent 6,342,608), Hoese et al. (US Patent

6,421,753), and Story et al. (US Patent 6,260,092), further in view of Droms ("Dynamic Host Configuration Protocol.")

14.   As per claims 4 and 21, Papa-Hoese-Story teaches the system above wherein the adapter has a slot identification number that identifies a location in the data storage system (Papa, figure 2, by canister/slot number). However, Papa-Hoese-Story fails to teach assigning a network layer address based upon location.

Droms teaches assigning a network address based on an identifier location (Droms, sections 2.1-2.2). It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have combined Papa-Hoese-Story and Droms to provide the IP assignment of Droms in the system of Papa-Hoese-Story, because doing so would allow allocating network addresses enabling use of TCP/IP communication (Droms, abstract).

15.   As per claims 9 and 26, Papa-Hoese-Story teaches the system above wherein an adapter may be changed during a configuration of the data storage system, the processor being coupled to the adapter via a network, the adapter being accessible via the network (Hoese, column 6, line 61 to column 7, line 3). However, Papa-Hoese-Story fails to teach the changing to a second network address which is accessible via the network.

Drums teaches changing a network address which is then usable by a network (Drums, section 3.2). It would have been obvious to one of ordinary skill in the art, at

the time the invention was made, to have combined Papa-Hoese-Story and Droms to

provide the IP assignment of Droms in the system of Papa-Hoese-Story, because doing

so would allow allocating network addresses enabling use of TCP/IP communication

(Droms, abstract).

16.   Claims 12, 13, 29, and 30 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Papa et al. (US Patent 6,342,608), Hoese et al. (US Patent

6,421,753), and Story et al. (US Patent 6,260,092), further in view of "Ping Manual

Page" ("Ping" hereafter).

17.   As per claims 12 and 29, Papa-Hoese-Story teaches the system above wherein

the diagnostic test comprises one of a built-in self-test (BIST) of the adapter (Hoese,

column 7, lines 19-24). However, Papa-Hoese-Story fails to teach a different test of the

adapter, the different test including transmission of a test vector along a first test path in

the adapter, the test path beginning and ending at a first I/O port that couples the

adapter to the controller when the one or more interfaces are coupled to the backplane,

the test path including a subset of the first set of ports of the switching system.

Ping teaches a test including a test vector that goes along a path that begins and

ends at a first I/O port, whose path includes a subset of the first set of ports of the

system (Ping, description). It would have been obvious to one of ordinary skill in the art,

at the time the invention was made, to have combined Papa-Hoese-Story and Ping to

provide the testing of Ping in the system of Papa-Hoese-Story, because doing so would allow diagnostic testing of the network.

18.   As per claims 13 and 30, Papa-Hoese-Story-Ping teaches the system further wherein the different test also includes the transmission of a test vector along a second test path in the adapter, the second test path beginning and ending at a different I/O port that couples the adapter to the controller when the one or more interfaces are coupled to the backplane, the second test path including a different subset of the first set of ports of the switching system (Ping, description).

Conclusion

19.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicholas Taylor whose telephone number is (571) 272-3889. The examiner can normally be reached on Monday-Friday, 8:00am to 5:30pm, with alternating Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rupal Dharia can be reached on (571) 272-3880. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-3718.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nicholas Taylor
Examiner
Art Unit 2141

RUPAL DHARIA
SUPERVISORY PATENT EXAMINER